Table 1. Early actions to reduce arsenic load to surface waters from legacy mining features at Stibnite.

Location	Type	Feature	Relative Arsenic Load	Status under PRO Mining Permit	Year Modified (if mining occurs per PRO)	Land Status	Early Action Candidate Site Work Descriptions	Regulatory Mechanism
Early Action Sites Suggested by Midas (Year 1)								
Near EFSRSR & Sugar Ck confluence	Waste (divert sfc water)	Bradley Dump	2	Partially removed by PRO	2-10	Unpatented	Divert Hennessey Creek around Bradley Dump (Midas, 2020).	CERCLA TCRA
Meadow Creek above EFSFSR	Waste (divert sfc water)	BMC Meadow Creek Mill+Smelter Site	5	Removed by PRO	2-10	Patented	Divert upgradient water around mineralized backfill materials (Midas, 2020).	CERCLA TCRA
EFSFSR above Fiddle Creek	Waste (divert sfc water)	SW flow from DMEA waste rock pile	13	N/A		Unpatented	Divert unnamed stream around DMEA waste rock pile (Midas, 2020).	CERCLA TCRA
Candidate Studies to Support Future Control of Adit Discharge (Year 1)								
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bailey Tunnel Adit Seep	8	Minimized by PRO dewatering	3	Patented	For bulkhead basis of design, monitor site weather station continuously, and collect continuous flow and water quality data. Use data to design collection system (sumps or interceptor trenches with transfer pumps to holding tanks for baseflow (minimum to average flowrates)) and to evaluate treatment options (haul to treatment plant, sulfate bioreactor or vertical wetlands). Evaluate adit for access and scope (Year 2) geotechnical study (Best Practices for Preventing Sudden, Uncontrolled Fluid Mining Waste Releases, EPA, 2017, OLEM 9200.3-118).	N/A - study informing NTCRA EE/CA
Meadow Creek above EFSFSR	Adit Discharge	SW flow from Meadow Creek Mine adit seep	9	N/A		Patented		
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Cinnabar Tunnel adit seep	10	N/A		Unpatented		
EFSFSR above Fiddle Creek	Adit Discharge	SW flow from DMEA Adit seep	18	N/A		Unpatented		
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bonanza Adit Seep	19	N/A		Unpatented		
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Monday Tunnel adit seep	20	N/A		Unpatented		
Candidate Studies to Support Future In-Water Work (Year 1)								
Meadow Creek above EFSFSR	Surface Water	SW flow from pond downgradient of Yellow Pine Pit	3	Mitigated during dewatering	3	Patented	Evaluate flow and water quality into and out of the pond.	N/A - study informing CERCLA TCRA
Meadow Creek above EFSFSR	Surface Water	SW flow from Keyway Marsh Outlet	7	N/A		Mixed, mostly Unpantented.	Evaluate flow and water quality into and out of the marsh. Collect data necessary to characterize substrate, vegetation, groundwater exchange, hydraulic residence time and loading rate, evapotranspiration and water balance within the marsh. Evaluate whether marsh can be enhanced to treat effluent to target concentrations.	N/A - study informing CERCLA TCRA
EFSFSR below Sugar Creek	Waste Rock	Seepage from Lower West End DRSF	6	Minimized by PRO dewatering	3	Mixed	To support in-water work planning and engineering requirements: map wetlands and Ordinary High Water Mark around waste rock piles and stream; prepare vicinity map, plan view and cross-section view of waste rock removal project; prepare plans and specifications for protection of fish life; prepare wetlands mitigation table where necessary.	N/A - study informing CERCLA TCRA
EFSFSR below Sugar Creek	Waste Rock	Seepage from BMC NW DRSF	12	Removed by PRO	2-10	Patented		
EFSFSR above Fiddle Creek	Waste Rock	CSM-PMC-SMI Upper ManCamp DRSF	16	N/A		Unpatented		
EFSFSR below Yellow Pine Pit	Waste Rock	Seepage from BMC NE Oxide stockpile #1	17	N/A		Unpatented		
EFSFSR above Fiddle Creek	Seep	SW flow from Garnet pit seep	14	N/A		Unpatented	For vertical wetlands evaluation, monitor site weather station continuously, and install Modified Parshall Flume near adit and collect flow and water quality data.	N/A - study informing CERCLA TCRA
Candidate Early Action Site Pilot Studies (Year 2)								
Meadow Creek above EFSFSR	Surface Water	SW flow from pond downgradient of Yellow Pine Pit	3	Mitigated during dewatering	3	Patented	Construct batch treatment plant and intake and conduct pilot test treatment of flow from pond.	Pilot Test for TCRA EE/CA
Meadow Creek above EFSFSR	Surface Water	SW flow from Keyway Marsh Outlet	7	N/A		Mixed	Based upon Year 1 evaluations, pilot test marsh enhancements or construct a pilot test of a vertical wetlands to treat discharge from the marsh.	Pilot test under CERCLA TCRA
EFSFSR above Fiddle Creek	Seep	SW flow from Garnet pit seep	14	N/A		Unpatented	Construct a pilot test of a vertical wetlands to treat discharge from the pit.	Pilot test under CERCLA TCRA
EFSFSR above Fiddle Creek	Adit Discharge	SW flow from DMEA Adit seep	18	N/A		Unpatented	For adits install collection system with baseflow to holding tanks and bypass to existing stream. Based upon Year 1 evaluations pilot test bioreactor or vertical wetlands, or complete road work necessary to haul baseflow to batch plant for treatment prior to discharge. Conduct geotechnical studies to support bulkhead design.	Pilot test and geotech study informing NTCRA EE/CA
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Cinnabar Tunnel adit seep	10	N/A		Unpatented		
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bonanza Adit Seep	19	N/A		Unpatented		
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bailey Tunnel Adit Seep	8	Minimized by PRO dewatering	3	Unpatented		
Meadow Creek above EFSFSR	Adit Discharge	SW flow from Meadow Creek Mine adit seep	9	N/A		Patented		
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Monday Tunnel adit seep	20	N/A		Unpatented		
Candidate Early Action Removal Actions (Year 2)								
EFSFSR below Sugar Creek	Waste Rock	Seepage from Lower West End DRSF	6	Minimized by PRO dewatering	3	Mixed	Move waste rock to (upland) staging area for one of the PRO DRSFs.	CERCLA TCRA
EFSFSR below Sugar Creek	Waste Rock	Seepage from BMC NW DRSF	12	Removed by PRO	2-10	Patented		
EFSFSR above Fiddle Creek	Waste Rock	CSM-PMC-SMI Upper ManCamp DRSF	16	N/A		Unpatented		
EFSFSR below Yellow Pine Pit	Waste Rock	Seepage from BMC NE Oxide stockpile #1	17	N/A		Unpatented		
EFSFSR above Fiddle Creek	Waste Rock	Bradley Dumps	2	Partially removed by PRO	2-10	Unpatented	Move in-water waste rock to (upland) staging area for one of the PRO DRSFs.	CERCLA TCRA
EFSFSR below Yellow Pine Pit	Waste Rock	BMC Meadow Creek Mill+Smelter Site	5	Removed by PRO	2-10	Mixed		
Candidate Early Remedial Actions (Year 3)								
Meadow Creek above EFSFSR	Surface Water	SW flow from pond downgradient of Yellow Pine Pit	3	Mitigated during dewatering	3	Patented	Ramp up intake volumes to batch plant to treat average flows, automate with winterization and shutdown capabilities to operate with minimal maintenance during winter months.	TCRA
Meadow Creek above EFSFSR	Surface Water	SW flow from Keyway Marsh Outlet	7	N/A		Mixed	Based on results of Year 2 work, enhance Keyway Marsh with substrate, vegetation and drainage features to optimize hydraulic residence time and loading rate, or construct full-scale vertical wetlands treatment system discharge from marsh.	CERCLA TCRA
EFSFSR above Fiddle Creek	Adit Discharge	SW flow from DMEA Adit seep	18	N/A		Unpatented	Continue baseline flow and water quality studies to support bulkhead design, complete geotechnical data gap investigations, ramp up treatment systems to treat average flows, and automate with winterization and shutdown capabilities to operate with minimal maintenance during winter months.	NTCRA EE/CA
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Cinnabar Tunnel adit seep	10	N/A		Unpatented		
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bonanza Adit Seep	19	N/A		Unpatented		
EFSFSR below Sugar Creek	Adit Discharge	SW flow from Bailey Tunnel Adit Seep	8	Minimized by PRO dewatering	3	Unpatented		
Meadow Creek above EFSFSR	Adit Discharge	SW flow from Meadow Creek Mine adit seep	9	N/A		Patented		
EFSFSR above Yellow Pine Pit	Adit Discharge	SW flow from Monday Tunnel adit seep	20	N/A		Unpatented		
EFSFSR above Fiddle Creek	Seep	SW flow from Garnet pit seep	14	N/A		Unpatented	Ramp up intake volumes to batch plant to treat average flows, automate with winterization and shutdown capabilities to operate with minimal maintenance during winter months.	CERCLA TRCA

Table 1. Early actions to reduce arsenic load to surface waters from legacy mining features at Stibnite.

Location	Type	Feature	Relative Arsenic Load	Status under PRO Mining Permit	Year Modified (if mining occurs per PRO)	Land Status	Early Action Candidate Site Work Descriptions	Regulatory Mechanism

DRSF - Development Rock Storage Facility (Waste Rock)
IPDES - Idaho Pollutant Discharge Elimination System
PRO - Midas proposed mining Alternatives 1, 2 or 4.
sfc - surface; SW - surface water
N/A - Not Applicable (i.e., not modified by actions in the mining proposal).
CERCLA Comprehensive Environmental Response, Compensation, and Liability Act (a.k.a. Superfund)
TCRA - Time Critical Removal Action
NTCRA - Non-Time Critical Removal Action
ROD/RA - CERCLA Record of Decision / Remedial Action
RI/FS - CERCLA Remedial Investigation/Feasibility Study
EE/CA - Engineering Evaluation/Cost Analysis (NTCRA under CERCLA)
CWA / NPDES - Clean Water Act / National Pollutant Discharge Elimination System (permit)

EPA, 2017, Best Practices for Preventing Sudden, Uncontrolled Fluid Mining Waste Releases, OLEM 9200.3-118
Midas, 2020, Proposed Early Actions - Midas Gold Stibnite Mine Site, Memo from John Meyer to Brad Marten, 24 pages.
Johnson, 1963, Modified Parshall Flume, USGS Open-File Report, 8 pages.

Notes: Early treatment of Yellow Pine Pit Lake deferred because of current function of Lake as sediment trap. Early treatment of seeps and springs associated with Meadow Creek tailings and DRSFs that are not in floodpain, and installation of bulkheads, deferred until disposition of PRO is known.
Year 1 Cost estimate total (not including Midas proposed early actions) - 680K; Year 2 -16.2M; Year 3 (including O&M) - 4.8M